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EXAMINER

VAN ROY, TOD THOMAS

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments with respect to claim 78 have been considered but are moot in view of the new ground(s) of rejection.

The Examiner notes that the Applicant's Pre-Appeal request arguments have been considered. The rejections from the previous office action are hereby withdrawn, and are to be replaced with the new rejections below based upon further review of the Applicant's specification and Declaration.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "constant" in claim 1 is a relative term which renders the claim indefinite. The term "constant" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

The Applicant has referred to the value of the refractive index to be constant both in the claim and in [0157]. The Applicant has also described fig.13 of the specification as demonstrating this constant value. The Examiner is of the opinion that fig.13 in fact shows a refractive index value that varies over time (non-zero slope). The Declaration

filed by the Applicant notes that the device of the Yamamoto patent has a refractive index which varies in accordance with fig.6 of the instant invention. The Examiner agrees that this graph does appear to show a variance in the index value over time. The Examiner admits that the two figures appear to vary at different rates; however the language of claim 1 states that the value is constant. It is the Examiner's position that if fig.13 is to denote a "constant" index value over time, then fig.6 (the device of the Yamamoto reference) is also to be considered "constant" as neither the specification nor the claims assign a value to the apparently relative "constant" term.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 78-80, 82-85, and 88-91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. (US 5303247) in view of Rakuljic et al. (US 5691989).

With respect to claims 78 and 88-91, Yamamoto teaches a laser light source comprising: a semiconductor laser for emitting laser light (fig.15 #52, and additionally that the light be generated in a solid state source, col.25 lines 15-26) and an optical wavelength conversion element (fig.15 #55) for receiving the light so as to generate a harmonic wave (col.24 lines 26-27), the optical wavelength conversion element having periodic domain inverted structures (col.23 lines 14-25) formed of a proton exchange layer (col.23 line 66 – col.24 line 16), and the refractive index of the exchange layer is constant at an ordinary temperature more than one day after its formation (see Arguments above). Yamamoto does not teach the semiconductor laser to be of the distributed feedback type (DFB). Rakuljic teaches a distributed feedback type laser (fig.21). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the laser light source of Yamamoto with the DFB laser, and laser amplifier of Rakuljic in order to use a precise wavelength laser medium, DFB (cols.16-17 lines 65-9) to pump a gain media at its exact absorption peak to increase pump efficiency (cols.17 lines 35-44) and increase the output power of the laser system.

With respect to claim 79, Yamamoto, and Rakuljic teach the laser light source outlined in the rejection to claim 78, and Yamamoto further teaches the optical wavelength conversion element to have a modulation function (col.24 lines 30-31, amplitude modulation).

With respect to claim 80, Yamamoto, and Rakuljic teach the laser light source outlined in the rejection to claim 78, and Yamamoto further teaches the optical wavelength conversion element to be formed on an  $\text{LiNb}(\text{x})\text{Ta}(1-\text{x})\text{O}(3)$  substrate (col.23 lines 17-18,  $\text{x}=1$ ).

With respect to claim 82, Yamamoto, and Rakuljic teach a semiconductor laser for emitting laser light (Yamamoto, fig.15 #52), and an optical wavelength conversion element in which periodic domain inverted structures (Yamamoto, col.23 lines 13-25) and an optical waveguide are formed (Yamamoto, col.24 line 22). Yamamoto, and Rakuljic do not teach the width and thickness of the waveguide to be 40um or greater. It would have been obvious to one of ordinary skill in the art at the time of the invention to adjust the dimensions of Yamamoto and Rakuljic to 40um or greater to adjust the power and modal outputs to fit the desired application (see MPEP 2144.05 II - In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) – describing it is not patentable to discover the optimal ranges by routine experimentation, namely waveguide dimensions).

Claims 83-84 are rejected for the same reasons as given in the rejections to claims 79-80 above.

With respect to claim 85, Yamamoto, and Rakuljic teach the laser light source outlined in the rejection to claim 82, and Yamamoto further teaches the waveguide is of a graded type (Yamamoto, col.5 lines 48-60, index grading).

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TOD T. VAN ROY whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2828

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/TVR/

/Minsun Harvey/  
Supervisory Patent Examiner, Art Unit 2828